REMARKS

Applicants would like to thank the Examiner for the thorough examination of the present application. The independent claims have been amended to more clearly define the present invention over the cited prior art references. The claim amendments and arguments supporting patentability of the claims are provided below.

I. The Amended Claims

The present invention, as recited in amended independent Claim 14, for example, is directed to an image sensor comprising an array of pixels, with each pixel comprising a photodiode, and a first output circuit for deriving a linear output signal by applying a reset signal to the photodiode and reading a voltage on the photodiode after an integration time. The first output circuit comprises a reset switch for applying a reset voltage to the photodiode. The reset switch comprises a reset transistor including a conducting terminal connected to the photodiode. A readout switch turns on the conducting terminal of the reset transistor after expiration of the integration time. The readout switch comprises a readout transistor including a conducting terminal connected to the conducting terminal of the reset transistor, and includes a control terminal.

A second output circuit derives a logarithmic output signal by reading a near instantaneous illumination-dependent voltage on the photodiode that is a logarithmic function of the illumination. The second output circuit comprises an amplifier including an output and at least one input connected to the

conducting terminal of the reset transistor, and a log select switch for connecting the amplifier to the photodiode. The log select switch comprises a log select transistor that includes a pair of conducting terminals connected between the output of the amplifier and the control terminal of the readout transistor, and also includes a control terminal to receive a log select signal. The first and second output circuits sequentially provide the linear and logarithmic output. An output selection circuit is coupled to the array of pixels for selecting between the linear output signal and the logarithmic output signal as an output signal.

Independent Claim 21 is directed to an image sensor, and has been amended similar to independent Claim 14.

Independent Claim 31 is directed to a method for operating an image sensor, and has been amended similar to independent Claim 14.

II. The Claims Are Patentable

The Examiner rejected independent Claims 14, 21 and 31 over the Morris et al. patent in further view of the newly cited Takahashi patent.

The Examiner referenced FIGS. 3 and 4 in Morris et al. as disclosing an image sensor **140** comprising an array of pixels **119**, with each pixel comprising a photodiode **152**. The Examiner referenced column 5, lines 34-35 as disclosing the image sensor operating in the logarithmic mode, and column 6, line 13 as disclosing the image sensor operating in the linear mode. A

multiplexing circuit **127** is configured as an output selection circuit for selecting between the linear mode and the logarithmic mode (column 6, lines 8-15).

For the first output circuit, the Examiner broadly characterizes reference elements **124** and **129** in FIG. 3 as the reset switch and the readout switch. In particular, the Examiner characterizes transistor **150** in FIG. 4 as the reset transistor including a conducting terminal connected to the photodiode **152**. For the second output circuit, the Examiner characterizes reference elements **156** and **160** in FIG. 4 as the amplifier and the logic select switch. When the logarithmic mode is asserted, a voltage V_G is applied to the transistor **150** and then the node **160** serves as the log select switch.

As correctly noted by the Examiner, Morris et al. fails to disclose that the logic select switch **160** comprises a log select transistor including a pair of conducting terminals connected between the output and the at least one input of the amplifier **156**. The Examiner referenced FIG. 2 in Takahashi as disclosing this feature of the claimed invention. In particular, transistor **Q3** is the log select switch and includes a pair of conducting terminals connected between the output and the at least one input of the amplifier **2**.

Takahashi discloses a photoelectric conversion apparatus for a photodiode **1**, as illustrated in FIG. 2. In particular, transistor **Q3** is illustrated as a diode. The function of transistor **Q3** is to perform logarithmic compression. In view of the amended claims in the present invention, the

Applicants submit that even if the references were selectively combined as suggested by the Examiner, the claimed invention is still not produced.

First, the independent claims have been amended to recite that the log select switch comprises a log select transistor including a control terminal to receive a log select signal. As best illustrated in FIG. 3 in the present application, the log select switch **M6** is a transistor that receives a **logsel** signal at its control terminal.

As best illustrated in FIG. 4 of Morris et al. and as characterized by the Examiner, transistor **156** is the amplifier and node **160** is the logic select switch. However, reference element **160** simply corresponds to a node between the photodiode **152** and the reset transistor **150**. In sharp contrast, the claimed invention recites that the log select switch comprises a log select transistor including a control terminal to receive a log select signal.

Second, the independent claims have been amended to recite that the readout switch comprises a readout transistor including a conducting terminal connected to the conducting terminal of the reset transistor, and including a control terminal. As best illustrated in FIG. 3 in the present application, reference **M2** is the readout transistor. The independent claims have been further amended to recite that the at least one input (-) of the amplifier **A** is connected to the conducting terminal of the reset transistor **M4** (which is also connected to the conducting terminal of the readout transistor

M2); and that the log select transistor **M6** is connected between the output of the amplifier **A** and the control terminal of the readout transistor **M2**.

As best illustrated in FIG. 3 of Morris et al., the Examiner broadly characterizes reference elements **124** and **129** in FIG. 3 as the reset switch and the readout switch, and in particular, the Examiner characterizes transistor **150** in FIG. 4 as the reset transistor. However, Morris et al. fails to disclose a readout switch comprising a readout transistor configured as in the claimed invention.

Accordingly, it is submitted that amended independent Claim 14 is patentable over the Morris et al. patent in view of the Takahashi patent. Amended independent Claims 21 and 31 are similar to amended independent Claim 14. Therefore, it is submitted that these claims are also patentable over the Morris et al. patent in view of the Takahashi patent.

In view of the patentability of amended independent Claims 14, 21 and 31, it is submitted that the dependent claims, which include yet further distinguishing features of the invention are also patentable. These dependent claims need no further discussion herein.

III. CONCLUSION

In view of the amendments to the claims and the arguments provided herein, it is submitted that all the claims are patentable. Accordingly, a Notice of Allowance is requested in due course. Should any minor informalities need to be

addressed, the Examiner is encouraged to contact the undersigned attorney at the telephone number listed below.

Respectfully submitted,

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